SUMMER/FALL 2013 ISSUE #1

Back to Our Roots:
Closer Collaboration for Salmon and the Watershed

By Flora Brain

This newsletter represents a return to our roots for the Mattole watershed restoration community. Though it is the first joint newsletter equally shared by the Mattole Restoration Council (MRC) and the Mattole Salmon Group (MSG) in nearly 3 decades, it is where we began: working closely together for the sake of the salmon and the watershed they depend upon. While we remain distinct organizations with separate missions, boards, and staffs, we recognize the intimate linkage of our goals and the necessity of combining our strengths as we work together to restore resiliency to Mattole fish populations, instream and upslope habitat, and the human communities and economies that support a healthy watershed in these times of change.

There are many things to celebrate in the Mattole. Along with this closer collaboration among the MSG and the MRC, the fact that we as a restoration community are now at the point of taking a comprehensive look at the lower river and estuary is noteworthy. What does this mean? It means, in part, that while our work of the past 3 decades—starting in the headwaters and working downstream to address forestry issues and road-derived sedimentation—is certainly not over, we have accomplished a vast amount, and it is now time to partially turn our gaze downriver.

Two generations, two organizations, working together: Staff and board members of the Mattole Restoration Council and the Mattole Salmon Group gather during a canoe tour of the Mattole River estuary on March 9th, 2013. Stopping to discuss recently deposited large wood and changes in the active river channel are, left to right, Drew Barber, Sungnome Madrone, Cam Thompson, Ray Lingel, David Simpson, Todd Hennings, Nathan Queener, Flora Brain, and Michael Evenson. ***Photograph by Gary "Fish" Peterson.***

Large dilemmas await in the lower river, where riparian restoration takes on a whole new suite of challenges (see article on pages 10-11). Likewise, the sheer scale of the forces at work in the Mattole River estuary/lagoon pose tremendous challenges to restoration (see pages 6-9). With ample humility and attention to past research and restoration efforts, these challenges can also be seen as learning opportunities, and the physical and biological forces of our watershed can be viewed as wise old teachers, whose strength and tenacity may on occasion surprise us youngsters with our short-term human conceptions of time.

I am writing this on a blessedly rainy day, one of the last days of May. As it falls on what could have easily have been the parched start of our dry season, I think of this rain nurturing the years of riparian plantings that hard-working crews have set down. I think of it invigorating the tiny native bunchgrass plugs up on Paradise and Prosper Ridges, whose little florets of hope represent rare native grasslands conserved. But to be honest, I think mostly of the salmon: this year's little parr and smolts heading to sea or to the estuary or to unknown shady havens in between, invigorated by this small flush of the world's greatest gift: fresh, clean water.

What a cause for celebration: that we live in a place where water flows unobstructed from wild mountains, circulates among small streams through forests and reedy marshes and our orchards and rain-collecting homesteads, making its own way to its big salty destination. With a committed, multigenerational community dedicated to working together, what place could have better odds for restoring native species and ecosystems?

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In this issue...

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Mattole Restoration Council Mission

The mission of the Mattole Restoration Council is the restoration of natural systems in the Mattole River watershed and their maintenance at sustainable levels of health and productivity, especially in regards to forests, fisheries, soil, and other plant and animal communities.

Mattole Restoration Council Vision

"We look forward to a Mattole that has healthy, self-sustaining, productive forests, meadows, and streams, with abundant native fish and wildlife populations. We envision a community that draws its sustenance from and lives in harmony with the environment. We seek to understand processes of natural healing and enhance them using best land practices in harmony with the local environment. We seek to enhance the exchange of knowledge among all community members toward that goal. We look forward to a time in the Mattole watershed when "restoration" will no longer be needed."

And a special Thank You to our supporters...
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and MRC Members and Friends of the Mattole.

From the Executive Directors:

Working Like a Watershed

By Sungnome Madrone and Hezekiah Allen

This newsletter marks a new milestone for the Mattole watershed community. It is the first joint newsletter of many to come with a new name: the Mattole Watershed News. This newsletter is a collaboration between the Mattole Restoration Council (MRC) and the Mattole Salmon Group (MSG). Future editions will include even more partners as this new approach evolves. A goal of this newsletter is to broaden the circle and the discussion, and to broaden the respect and support for the changes that are upon all of us.

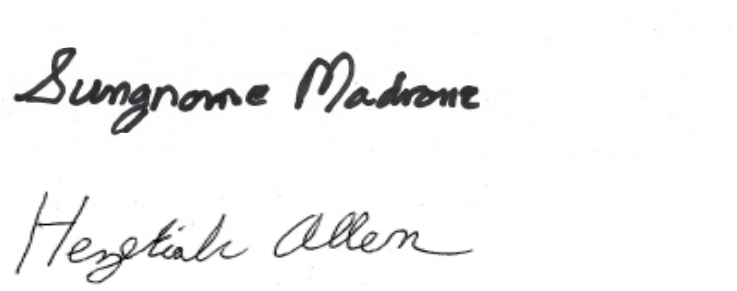
In the spirit of broadening that circle, we would like to honor the many partners that have made our work possible. First in all of this are the landowners, for it is you who provide the access permission to accomplish on-the-ground projects. Be you public or private, we offer you our sincere gratitude for your support. If any landowner in the Mattole has any concerns or a desire to offer access for fish surveys or restoration work, please contact us. It is the landowners plus private contractors and consultants that make the first leg of a functional three-legged stool.

Public agencies and private foundations make a second leg, often providing funding for projects such as road upgrades, fuels reduction, habitat restoration and monitoring, and water conservation. The BLM manages significant land in the watershed and also provides funding for restoration; US Fish and Wildlife Service, NOAA Fisheries, the State and Regional Water Boards, State Coastal Conservancy, the Environmental Protection Agency, the Department of Water Resources and the Department of Fish and Wildlife have also been major funders and have provided valuable technical support for projects. Several private foundations have provided significant financial support as well.

The third leg is made up of non-profits like Sanctuary Forest, Inc. (SFI), the Mattole Restoration Council (MRC), and the Mattole Salmon Group (MSG), who all work together as partners in the Mattole River and Range Partnership (MRRP). Confusing? So many acronyms and organizations! The bottom line is that we have many organizations and partnerships with members of all three legs on that stool, and that allows us to be stable and successful. Our cooperative efforts will continue to manifest in new and productive forms.

Time changes all things. We either adapt or die; we bend in the wind or break. As people we are adaptable, and we are like the salmon: indomitable. So, together we can work like a watershed, learning from each other and supporting each other. When we focus on areas we all have in common, we can accomplish great things. Our Mattole River and Range Partnership currently includes the three groups listed above and will include others in the future. We are committed to adapting our systems, approaches, and organizational structures as necessary to survive and succeed. What form these changes will take is hard to predict, but one thing is clear: if we have respect for the past, respect for the present and each other, then a respectful future will unfold.

Sincerely,



Sungnome Madrone and Hezekiah Allen

16th Annual Coho Confab on the Mattole River

August 9-11, 2013

The Coho Confab is a symposium to explore watershed restoration, learn restoration techniques to recover coho salmon populations, and to network with other fish-centric people. Restoration pioneer Richard Gienger coined the term "Confab" from the verb "confabulate" which literally means to informally chat or to fabricate to compensate for gaps in one's memory. The 16th Annual Coho Confab will be held in the Mattole River Valley. Salmonid Restoration Federation and Trees Foundation are the permanent co-hosts of this educational event and are excited to be partnering this year with the Mattole River and Range Partnership that includes Sanctuary Forest, Mattole Restoration Council, and the Mattole Salmon Group. The Confab is sponsored by the California Department of Fish & Wildlife.

The Confab allows for participants and instructors to share innovative techniques, pioneering experience, and scientific methodologies. Participants learn skills and techniques that can be applied to restore habitat in their home watershed. The Coho Confab will open with a Friday evening community dinner. The evening will continue with orientation presentations including a presentation about the History of Mattole Restoration and Partnerships with Sungnome Madrone, Executive Director of the Mattole Salmon Group, and Richard Gienger, founder of the Coho Confab. Tasha McKee, Executive Director of Sanctuary Forest, will discuss "Land and Water Stewardship, Past and Present," and Hezekiah Allen, Executive Director of the Mattole Restoration Council, will give a presentation entitled "Cannabis and Stewardship: Are Family Farms and Rural Homesteads Compatible with Watershed Recovery?"

On Saturday there will be several concurrent field tours in the morning including a tour of riparian restoration projects, estuary restoration projects, and a macro-invertebrate sampling workshop. In the afternoon we will have a plenary session focused on "Creating a Road Map and Action Plan for Coho Salmon Recovery in the Mattole and Beyond" with presentations from Geneticist Carlos Garza of NOAA Fisheries regarding coho salmon genetics and recovery actions that would benefit this endangered species; a coho salmon rescue and rehabilitation discussion with a representative of the California Department of Fish and Wildlife, NOAA Fisheries, and staff from the Mattole Salmon Group, and a panel discussion about "Innovative Restoration Strategies to Address Key Constraints to Recovery" with Tasha McKee of Sanctuary Forest, and special guests Landscape Ecologist Tommy Williams, PhD, of the Southwest Fisheries Science Center, and Ecosystem Analyst Michael Pollock, PhD from the Northwest Fisheries Science Center of NOAA Fisheries, and Kevin Shaffer of the Fisheries Restoration Grant Program of the California Department of Fish and Wildlife.

Sunday concludes with a half-day of concurrent tours including a tour in the Mattole estuary/lagoon, exploring innovative approaches in Baker Creek, a tour focused on "Human Communities and Working Lands: Roads, Fuels Reduction, Forestry, and Water Conservation" with Hezekiah Allen and Nathan Queener of the Mattole Restoration Council, and a tour highlighting erosion control and habitat improvement projects in South Fork Eel River tributaries with the Eel River Salmon Restoration Program.

Saturday evening we will have a BBQ dinner and cabaret. Please come prepared with layers of clothes, sunscreen, a sun hat, a personal water bottle, flashlight, camping gear if needed, hiking shoes and river sandals.

To register for the Confab or to view the agenda, please visit www.treesfoundation.org or www.calsalmon.org.

Mattole Salmon Group

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Mattole Salmon Group Mission

The Mattole Salmon Group works to restore salmon populations to self-sustaining levels in the Mattole watershed.

Thank You to our Funders...
Bella Vista Foundation • Bureau of Land Management • CA Department of Conservation • CA Department of Fish and Wildlife • CA Department of Water Resources • Cereus Fund FishAmerica Foundation • Mattole Restoration Council National Fish and Wildlife Foundation • National Oceanic and Atmospheric Administration • State Coastal Conservancy • The Nature Conservancy • US Fish and Wildlife Service

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Native Plants in the Mattole

By Monica Scholey

The place that we live in is one of beauty and open space. This is an ever-changing landscape that presents new challenges and opportunities throughout time, and most people who live here love the Mattole and have an intimate connection to its streams, forests and grasslands. Part of what makes this such a wonderful place is the daily opportunity to observe and appreciate our non-human neighbors. As we carve out our own niche on this landscape we can continue to share this space, encourage ecological functions and even invite beneficial organisms into our homesteads and ranches. One way to do this is to landscape with native plants.

The landscape as it was

Our native perennial grasslands have slowly been converted to annual grasses introduced from Europe. To see what our grasslands once consisted of you only need to venture into the King Range to the isolated grasslands of Spanish or Oat Ridge. There you will find fields of rich California oat grass (*Danthonia californica*), Idaho fescue (*Festuca idahoensis*), California brome (*Bromus carinatus*) and blue wild rye (*Elymus glaucus*). One account of the Mattole landscape as it was comes from James Roscoe's *Ethnohistory of the Mattole*. In 1854, George Hill explored the lands of the lower Mattole and spoke of its plant communities in glowing terms.

> "The prairie is covered with the finest specimen of clover which grows to an almost unheard of height, the timbered lands are covered with wild oats and several varieties of grass."

Although the beauty that George Hill described is still here, ecologically we have a much different landscape. We are missing the productivity of species whose roots can reach up to 10 feet underground and live up to 100 years. These bunchgrasses offer erosion control and increase rainwater infiltration. Unlike non-native annuals that need to be re-seeded every 2 to 5 years, these long-lived native bunchgrasses do a better job at keeping the soil structure intact, sequestering carbon in the soil and reducing maintenance costs. Perennial grasses also typically stay green on the hillsides longer into the year than annual grasses.

Why landscape with natives?

The ecological benefits of perennial bunchgrasses are just one example of what native plants can bring to the landscape. There are also native plants that fix nitrogen such as blue blossom (*Ceanothus thyrsiflorus*), have medicinal value such as Oregon grape (*Mahonia* sp.), are edible such as California hazelnut (*Corylus cornuta*), and attract butterflies, hummingbirds, grouse and other beneficial wildlife such as the red flowering currant (*Ribes sanguineum*). Incorporating these plants into your orchard or garden increases biodiversity and adds a layer of complexity, which can help confuse or deter unwanted pests on your plants.

In addition to our own utilitarian reasons for bringing native plants into our gardens, we can also attempt to consider things from their perspective. In our area exist a handful of rare and endemic plants – such as goldthread (*Coptis lacinata*), maple leaved checkerbloom (*Sidalcea malachroides*) and leafy reedgrass (*Calamagrostis foliosa*) —whose abundance or spatial distribution is limited. By nurturing these beautiful plants in our gardens, orchards and surroundings, we can help ensure that their populations continue in the future.

Grow your own!

Native plants are typically easy and fun to grow. First locate a population of a plant you are interested in growing and patiently observe its pattern of flowering and fruiting. Typically seeds are collected from fleshy fruits when the fruit is fully ripe and from dry dehiscent fruits when the seed coat turns brown. For larger seeds, you can wait until they drop off the tree or shrub. Or test a single seed throughout the fruiting season to observe its growth and development. A ripe seed is typically dark in color and more firm than dough. Some seeds have internal or external dormancy and need treatment before planting. The Native Plant Network's propagation protocol database http://www.nativeplantnetwork.org/network/ is an excellent resource for information on pre-germination treatment. Next you want to plant the seed, keep it moist and put it in a warm place until germination. Native plants can tolerate a wide range of conditions, but you will be most successful if you keep your seedlings moist and in partial shade through the summer. Then watch as the magic unfolds!

If you would like to learn more about cultivating native plants, come by the MRC's Native Plant Nursery at the corner of Mattole Road and Old Coast Wagon Road for one of our monthly volunteer days. If you want to try planting some natives but don't have time to grow your own, then come on by and see what we have available for sale!

The demonstration garden at the Mattole Restoration Council's Native Plant Nursery, just three years after being planted. Stop in to see the garden in its full summer glory! ***Photograph by Monica Scholey***

Straying Salmon: Foreign Fish in Friendly Waters?

By Nick Tedesco

A 2010-2011 memo by the California Department of Fish and Wildlife (DFW) stated "Coho salmon are at low abundance levels on the Mattole River." Over the years, the coho population has declined to a point where many think the species will be lost completely from the Mattole watershed. A Mattole River coho sighting is a big deal now-a-days. During the winter 2012-2013 season, Mattole coho were positively identified both live and dead, and coho carcasses have been recovered downstream of redds that were assumed to be coho redds. However, until this year, active spawning of coho salmon had not been documented in the Mattole River for four years.

During a survey in mid-January, my survey partner and I positively identified a pair of spawning coho in the upper mainstem of the Mattole River. We were elated to see spawning coho. Word spread through our crew, to locals, and eventually to DFW. "Those coho are probably strays from the Eel River," said one anonymous biologist from DFW.

As much as we wanted to believe that the spawning coho we saw are genetically Mattole stock, considering the recent lack of abundance of coho in the Mattole, it is surely possible that they could be strays from the Eel River or other nearby watersheds. We will have much more information once we have their scales, otoliths, and tissue samples analyzed. The idea that these fish are, according to the DFW biologist, likely strays has made me think about the importance of salmonid straying.

Philopatry is the behavior of homing, or returning to an individual's birthplace to mate. Salmon are philopatric. Naturalists noticed that adult salmon return to their natal stream as far back as 1527, and more recent studies have proven this to be true. In the 1950s, scientists found that salmon home to their natal streams to spawn using their olfactory sense, the sense of smell. Salmon smell the chemical composition of their natal stream, and this smell is imprinted to their memory at different phases of their outmigration. As adults returning to spawn, salmon may travel in and out of various watersheds trying to find these imprinted scents, until they find the correct sequence of scents that take them back to their natal stream (Quinn 2005).

Straying occurs when salmon do not return to their natal stream, and instead go to a different stream or watershed altogether. It is unclear if straying reflects a failure to home or if it is an opportunistic decision to spawn elsewhere. It is clear, however, that straying has been, and will be, essential for the persistence and distribution of salmon (Quinn 2005).

This female coho salmon spawner was found in January 2013 by Michelle Dow (pictured) and Nicholas Tedesco in Baker Creek, in the headwaters of the Mattole River watershed. The question of whether this fish was spawned in the Mattole River or the nearby Eel River is discussed in this article. Luckily, she appeared to have spawned successfully before having either died of natural causes or being caught by a predator. ***Photograph by Nicholas Tedesco***

Why do salmon home?

Salmon that home have their own survival as proof that their parents' spawning grounds had conditions that were good enough for salmon to not only be spawned, but to also make it back alive (Quinn 2005). Homing results in locally specialized life-history adaptations and fitness characteristics that structure populations and increase reproductive success (Curry et al. 1994, Dittman and Quinn 1996, Hendry et al. 2004, Quinn 2005). Salmon who survive to spawn will have survived through local habitat conditions (water quality, habitat, food, etc.) and their offspring will be genetically disposed to survive in those same local conditions.

Why do salmon stray?

In *The Behavior and Ecology of Pacific Salmon & Trout*, Thomas Quinn hypothesizes that strays test the suitability of different streams every year. Some streams are more stable than others. A stream that has consistent water flow and consistent habitat conditions is considered stable. A stream that has good habitat one year and poor habitat the following year is considered less stable. Quinn suggests that salmon that are reared in a stream with low stability will produce more salmon that are strays in order to increase the chance that those fish have a more stable stream to spawn in.

Rates of straying are higher when a population is low and, likewise, rates of straying are lower when populations are high. The translocation of Chinook salmon to one river in New Zealand quickly led to unaided colonization of several other rivers within 15 years, but the present level of straying among rivers is not high enough to account for the widespread colonization that apparently took place after the initial introduction (Unwin and Quinn 1993). As the population increased, the rates of straying slowed. The salmon started to become specialized to their new natal streams and then they started homing at an increasing rate.

When population densities get too low, straying is a mechanism for maintaining genetic diversity (Hamann and Kennedy 2012). After generations, if salmon did not stray, the genetic makeup of a given population will be extremely similar. One virus, disease, or bacteria may have the ability to wipe out an entire population. Straying is a method for getting new, different genes into new

- see "Straying Salmon" on page 14

A Systems Approach to Mattole Estuary Restoration:

Informing Proposed Restoration Actions with the Past and Present

By Sungnome Madrone, Michael Evenson, and Drew Barber

Above: The Mattole lagoon as mapped by the U.S. Coast and Geodetic Survey in 1896. Some cite this map as evidence that the Mattole estuary once contained extensive edge habitat and deep slough channels separated by stable, well-vegetated islands. (In the above map, notice the two large islands on the south side which are stippled as though to convey the presence of vegetation—unlike the dotted river bar upstream and to the right, with the "Mattole River" label on it.) Restorationists seek to restore the Mattole River estuary/lagoon to some such state, with increased channel stability, habitat complexity, vegetative colonization and growth, topographic and substrate diversity, connectivity to existing sloughs and other off-channel habitat, and increased availability of food for native salmonids.
Map courtesy of NOAA's Office of the Coast Survey Historical Map and Chart Collection: http://historicalcharts.noaa.gov/historicals/preview/image/5795-1-1896

The Mattole estuary and lagoon is a key habitat for all three of our native salmonid species. This habitat provides an important point of transition for fish entering or leaving the river system. Local restoration groups, with fish and wildlife agencies, have been studying and working in the estuary since the 1980s in efforts to understand this important habitat and how to improve it.

Presumably, juvenile salmonids preparing to enter the ocean have historically used a healthy estuary/lagoon system to fatten up and grow. Chinook salmon and steelhead enjoy the use of the estuary as a large number of them migrate to the estuary/lagoon in spring and may spend the summer there. Coho salmon may not use the estuary for as lengthy a period, but they still benefit from a "boost" from the abundant estuary/lagoon system. Diverse food resources can exist here, both drifting in from freshwater and riparian environments, and deriving from rich ocean nutrient inputs. Studies have shown that fish size upon entering the ocean is linked to salmonid survival in the ocean, and larger sizes at outmigration increase their chances of returning as adult spawners.

In the early 90s the Mattole Salmon Group (MSG) placed several log structures and completed numerous planting projects in the estuary. In early 2000 we established an annual program committed to installing instream large-wood structures and evolving our techniques. Between 2002 and 2012 we installed eight large wood structures in the estuary. As our methods developed, the size and complexity of the structures increased. We found from this work that whole trees are more long-lived in the estuary environment than even complex large-wood structures, in some cases. In this past decade, there has also been an increased focus on restoring off-channel habitats in the estuary.

A map of the Mattole lagoon from 1896 shows a very different configuration than that of today. There was a complex set of off-channel habitats and alcoves that likely provided winter refuge and excellent summer rearing habitat with plentiful food and cover. Today's estuary/lagoon lacks that complexity due to an increased sediment load from upstream, and extensive removal of large wood. These changes have led to an estuary/lagoon with little topographic diversity and a limited number of deep pools with overhanging riparian vegetation. The Mattole River has been meandering from bank to bank, removing vegetation before the vegetation has a chance to grow large enough to provide substantial benefit. Additionally, off-channel slough habitat became further

disconnected from the river after the 1992 large earthquakes and uplift near the mouth.

Available information, including studies from other river systems documenting salmonid use of estuarine habitats, suggests that the depressed status of the Mattole River Chinook and coho salmon populations can be partially tied to degraded estuary and lagoon rearing conditions, which may represent a bottleneck to their recovery. The Mattole Salmon Group—as part of the Mattole River and Range Partnership with the Mattole Restoration Council and Sanctuary Forest, Inc.—along with agency partners including Bureau of Land Management (BLM), US Fish and Wildlife Service (USFWS), California Department of Fish and Wildlife (DFW), California Department of Water Resources (DWR), State Coastal Conservancy (SCC), Environmental Protection Agency (EPA), National Oceanic and Atmospheric Administration (NOAA) and the Bella Vista Foundation are pursuing creative ways to address this potential bottleneck and enhance salmon populations in the basin.

Restoration of fish habitat in the Mattole River estuary requires a comprehensive multi-year approach. The Mattole Restoration Council has been working watershed-wide for three decades on sediment control projects concerning roads and stream banks; the Mattole Salmon Group has been placing large wood throughout the headwaters and estuary areas, and Sanctuary Forest has been constructing groundwater recharge "beaver dams" and implementing water and land-use conservation measures. As a part of this productive partnership, the Mattole Salmon Group and the Restoration Council are now increasing our focus on treatments that can help improve estuary and lower-river habitat conditions (see article on page 10). The most recent approach to estuary restoration is led by the BLM, who manages the lower three miles of the river floodplain. They have developed a 5-Year Estuary Restoration Plan with the assistance of local groups and agencies.

The approach being used in this current phase of estuary restoration is driven by a set of biological objectives, which, in turn, are controlled by various physical processes at work in the lower Mattole River. The biological objectives of this effort are to improve juvenile salmonid survival during summer low-flow periods and to increase the availability of suitable winter habitat, with emphasis on juvenile coho salmon winter refuge habitat.

The biological objectives of this effort are to improve juvenile salmonid survival during summer low-flow periods and to increase the availability of suitable winter habitat, with emphasis on juvenile coho salmon winter refuge habitat.

To accomplish the above objectives, the Mattole Salmon Group and the Restoration Council seek to integrate our understanding of the dynamic nature of the lower river by identifying a suite of physical river features for treatment. The intent of these treatments has several objectives, including increasing channel stability, habitat complexity, vegetative colonization and growth, topographic and substrate diversity, connectivity to existing sloughs, alcoves, and other off-channel habitat, and increasing available food for native salmonids in the lower Mattole River.

Four specific types of projects are proposed in the BLM's plan: 1) placing large wood structures on islands; 2) installing structures at the apex of river bars; 3) treatments along the margins of river terraces; and 4) re-connecting a slough channel to the estuary.

With this new plan and permits for work in hand, the Mattole Salmon Group and the Restoration Council have begun fundraising to implement the first phase of this work. Significant funds have been secured from multiple sources. These include DWR, the National Fish and Wildlife Foundation (NFWF), USFWS, BLM, NOAA, The Nature Conservancy, DFW, and local landowners (who are donating whole trees for large wood structures).

The Mattole Salmon Group and the Restoration Council will be busy in the coming year assessing past work in the estuary

- continued on page 8

Above: The Mattole lagoon on September 27, 2009. Traces of a historic slough channel remain visible within the southern portion of the riparian forest (right side of photo). Comparison of aerial photographs taken in 1972 and 1979 (also available at www.californiacoastline.org) convey that a prominent "south slough" channel developed during the 1970s via natural recovery following large-scale denudation and sedimentation of the estuary. Since its establishment, the riparian forest has filled in the south slough channel. Restorationists and agency partners are interested in the possibilities of restoring such off-channel habitats, which provide salmonids with abundant food, cover, and refuge from high winter flows. ***Photograph courtesy of California Coastal Records Project: www.californiacoastline.org***

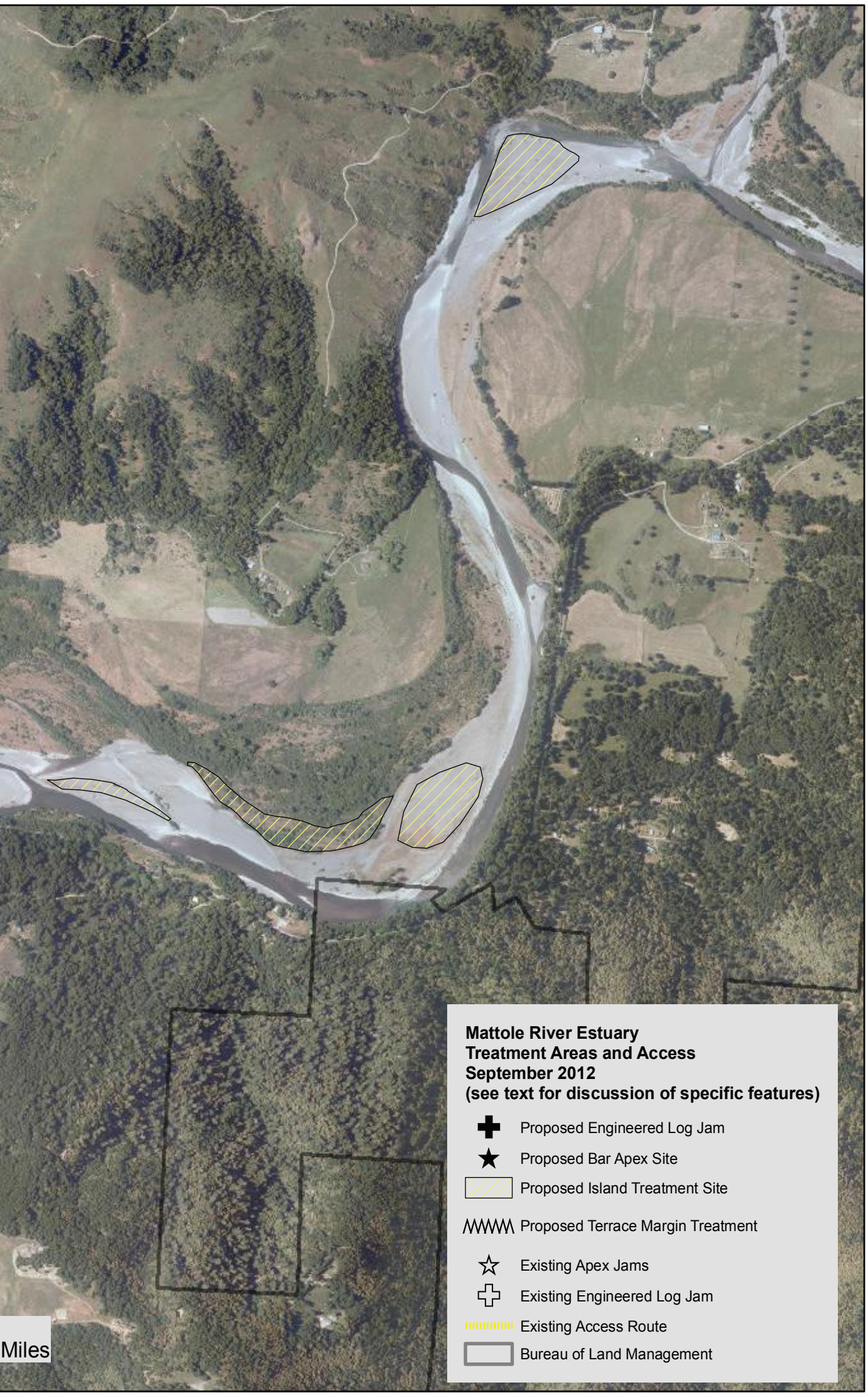
Above: Proposed treatment sites and types of treatments, taken from BLM's 5-Year Estuary Restoration Plan. Treatments are overlaid on an aerial ph

and finalizing designs for a round of construction in summer 2014. Significant changes happened in the estuary during bankfull flows in the winters of 2011-2012 and 2012-2013. There is much to learn from past work and recent flows, but several things are clear and have informed this next phase of work. Namely, whole trees are more stable at bankfull events than even large complex wood structures that are bolted together and tethered to large ballast boulders. Large whole trees with intact rootwads and branches can only be moved by helicopter. Whole tree structures will require less metal anchoring, reducing one of the main costs of our previous structures.

With local crews and heavy equipment contractors, the upcoming work will include whole tree removal from nearby upslope prairie locations where conifers have encroached upon native meadows. The whole trees will be flown by a helicopter with rootwads and crowns attached and placed in the estuary and lower river. Tree donor sites will be restored with light grading and mulching and native grass seeding.

Helicopter use will be for only two days. Flight paths and safety measures will be in place and ample notice will go out to the community when operations are planned. The benefit of helicopter use is that it will enable the placement of intact trees, which was not an option when we were confined to trucking materials. Whole trees more closely mimic natural recruitment into the river system.

Whole trees will be placed in a variety of configurations on islands, at the upstream ends of bars, in the river channel, and along terrace margins (see project map). Extra long willow and cottonwood cuttings will be placed in deep trenches excavated in and around new large-wood structures. We will also excavate some off-channel slough



oto of the lower Mattole River and estuary taken in 2010. ***Map courtesy of BLM.***

"There is much to learn from past work and recent flows, but several things are clear and have informed this next phase of work.

Namely, whole trees are more stable at bankfull events than even large complex wood structures..."

"We expect to learn many lessons...

We cannot duplicate Mother Nature and must have a great deal of humility in even attempting to try.

Our hope is to be helpful by adding large wood and riparian plantings in the form of whole trees and live cuttings to the system now, while upriver riparian planting takes hold and will some day provide natural large wood recruitment to the river and estuary."

habitat (250 linear feet) to reconnect these nutrient-rich rearing areas to the river. The results of these initial excavations will help determine the potential for reconnecting nearly one mile of similar habitat in the south slough riparian forest.

We are excited about this next phase of work in the estuary and expect to learn many lessons from past and proposed work. We cannot duplicate Mother Nature and must have a great deal of humility in even attempting to try. Our hope is to be helpful by adding large wood and riparian plantings in the form of whole trees and live cuttings to the system now, while upriver riparian planting takes hold and will some day provide natural large wood recruitment to the river and estuary. We are thinking long term and short term. We are working across the whole watershed and we are working together like a watershed from top to bottom.

Looking Back, Moving Forward: 10 Ye

Restoring riparian areas in the Mattole has been and continues to be one of our highest priorities in our efforts animal, and insect communities and act as a natural filter that enhances many aspects of aquatic habitat. For th treat dysfunctional riparian areas along Mattole tributaries and the mainstem Mattole River. In collaboration w 50% of the tributaries to the Mattole, from the headwaters of the Mattole to the ocean. As the checklist of comple what we have accomplished, what our current priorities are, and what the future of riparian restoration projects

Where have we been…what have we accomplished?

The RER program has come a long way over the past 10 years. My first day of planting in the Mattole (in December of 2006) consisted of loading up a bag of 2-year-old Douglas–fir bare roots and lunch for the day, walking up the creek to look for places to plant, and nestling trees in the ground under the brisk winter rains. Anyone who has planted trees knows that although these days are long, exhausting and wet, they are some of the most beautiful and memorable moments of one's life.

For years the most common technique for riparian revegetation in the Mattole was exactly that: opportunistically planting redwood and Douglas-fir trees along Mattole tributaries and the mainstem. This type of treatment was very effective in getting trees established in some tributaries, but it did not always address the problems on sites that had small bank failures or sites where planting different species of trees, shrubs, and grasses would have been more appropriate. Over the past 6 years, we changed our technique to developing site-specific prescriptions for each individual site that included multiple riparian treatments. These sites are prioritized based on a number of ecological criteria. In addition, we considered whether or not GRCC had completed work in the tributary, and in which tributaries treatment would give us the biggest bang for the buck. Many of these treatments took place after GRCC had finished large-scale bank stabilization projects, or in tributaries where heavy equipment was not an option due to permitting or access for heavy machinery. As opposed to the earlier approaches, we now use a number of methods to address riparian issues. We apply multiple revegetation treatments such as broadcast seeding of 10 different species, plug and large container planting of 20 different species, and erosion control and bank stabilization treatments using willow fences and fascines. Some slides and bank stabilization sites are mulched with native grass straw after project completion. Although we are not currently planting the large quantities of trees we did in the 2000s, planting fewer trees on more specifically targeted sites is a more effective treatment – and use of funds – for most tributaries where we are now working. We also now grow almost all of our plant material at the MRC Native Plant Nursery from seed collected from sites with similar characteristics as our restoration sites.

Whether it was opportunistic planting completed during the program's earlier years or more recent site-specific treatments, we accomplished a lot over the past 10 years. None of this work could have been completed without our devoted crews that include tree planters, landowners, volunteers, and interns. Below is a summary of our accomplishments over the past 10 years. The Riparian Ecosystem Restoration Program:

- Planted 300,000 trees and 30,000 shrubs and grasses on 40 Mattole tributaries and along the mainstem Mattole river;
- Collected 655 lbs. of riparian seed;
- Distributed over 400 lbs. of riparian seed, covering approximately 15 acres of riparian slides;
- Propagated 55,000 plants at the Native Plant Nursery;
- Installed 1800 ft. of willow fence on 4 tributaries;
- Thinned 6 acres of overstocked riparian forest to promote old-growth forest conditions;
- Conducted riparian assessments on 55 Mattole tributaries and along the mainstem Mattole River.

Left: RER planting crew heading up Big Finley Creek in January 2008.
Photograph by Monica Scholey

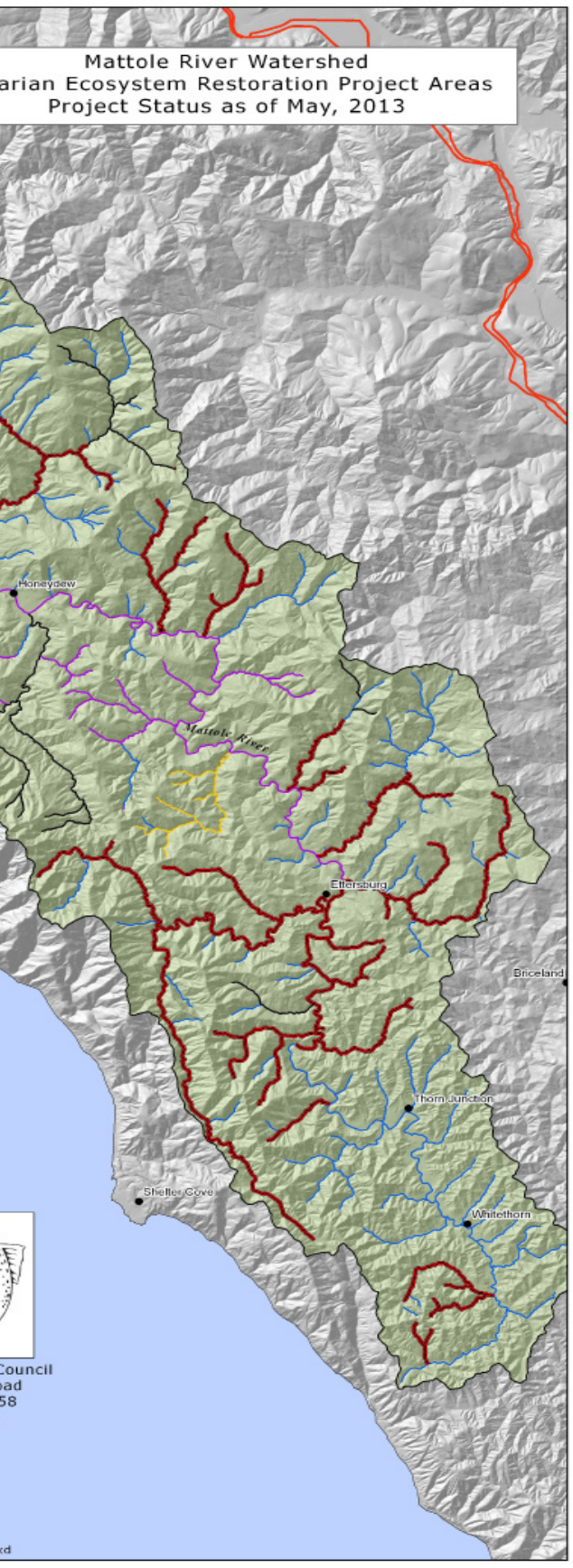
Current

After years of planting from the headwaters down, we are the past 2 years, we have focused our riparian efforts on Devils Cr Granny Creek, and the lower 10 miles of the mainstem of the Ma grasses, of which 26,000 were grown at the Native Plant Nursery. and over 1,000 seed balls on riparian slides and bank stabilization of willow fascines (fascines are rough bundles of brushwood or oth structure) at bank stabilization sites on Granny Creek and Cook Gul from browse by livestock and deer. We also purchased an electr protect up to ¼ of a mile of plantings from livestock. These sites w

ars of Riparian Ecosystem Restoration

By Hugh McGee

to aid in the restoration of ecological processes in the watershed. Riparian areas provide vital habitat for plant, e past 10 years the MRC's Riparian Ecosystem Restoration (RER) Program has made a strong effort to assess and ith MRC's Good Roads Clear Creeks (GRCC) Program, the RER program systematically assessed and treated over eted tributaries fills, and funding for riparian work in the Mattole dries up, we take a step back and briefly examine looks like.



Projects

e now focusing projects in the Honeydew and Petrolia areas. Over eek, Oil Creek, the mainstem of the Upper North Fork, Cook Gulch, attole River. During this time we planted 38,500 trees, shrubs and We distributed 227 pounds of riparian tree, shrub, and grass seed sites. We also installed over 1,000 feet of willow fence and 200 feet er material - in this case, willow - used for strengthening an earthen lch. Tree protection was installed on these sites to protect seedlings ic fence with funding from a landowner donation. This fence can ill be weeded and watered by volunteers when appropriate.

The future of riparian restoration in the Mattole

Many of the riparian areas that have been assessed over the past 10 years have been treated. It is important to keep in mind that "treated" does not mean restored. Many of these sites will be monitored and maintained, and only time will tell if they have been effectively restored. It is also important to note that there are some tributaries, such as large sections of the Lower North Fork and Squaw Creek, where access has not been granted. From aerial photograph assessment, it appears that there is an ecological need for extensive riparian work that could be completed in those tributaries, as well as others where access has not been granted.

As we look back at all of the work we have accomplished along Mattole tributaries and the upper and middle Mattole, we look forward to a lower river that is in severe need of riparian and instream restoration. Treatment of these sites is not as easy as carrying a loaded tree bag and hoedad out to a creek and planting trees all day. Many of these sites are riparian deserts with little to no soil nor organic material to work with. Planting plugs and container plants on many of these sites would most likely be a waste of time. So how do we begin to restore riparian floodplains along the lower river? A collaborative effort between MSG, MRC, BLM, and other agencies and practitioners will begin this long process. This team is working together to identify and treat floodplain restoration sites along the lower 5 miles of the Mattole. Willow and cottonwood baffle installation using an excavator in coordination with large wood installation projects in the lower river will allow for un-vegetated gravel bars to begin building soil and organic material, and make way for natural regeneration and riparian planting sites 10 or 20 years from now, or maybe further into the future, depending on nature's own timeline.

Although lower river floodplain restoration will surely be the highest-priority riparian restoration project for years to come, the RER program will still also continue to focus on other priorities such as assessing Mattole tributaries that have not been treated, riparian fencing projects, and maintaining and monitoring completed sites.

As much as we all love to sit along a creek and have the sun pour down on us, I think we all look forward to a day when we gaze skyward from Mattole tributaries, in the refreshing deep shade of healthy riparian forests and with abundant, cool, clear waters burbling underfoot in the heat of summertime.

Below: RER crew installing a willow fence on Granny Creek.
Photograph by Hugh McGee

MRC and BLM Continue Partnership to Restore Native Grasslands

By Hugh McGee

Native grassland enhancement crew planting on Paradise Ridge.
Photograph by Hugh McGee

Since 2006, the MRC has partnered with BLM in a collaborative effort to restore native grasslands in the King Range National Conservation Area (KRNCA). With assistance from the BLM Arcata Field Office, The National Fish and Wildlife Foundation, and the Conservation Lands Foundation, MRC's Native Grassland Enhancement Program has been able to accomplish many objectives in its goal to restore KRNCA grasslands.

Over the past 6 summers, field crews have spent long hot days surveying coastal grasslands and collecting seed from various rare and locally uncommon grass species on remote ridges of the KRNCA. During that time, over 1000 acres of grasslands have been surveyed to identify native grass populations and establish collection sites. To date over 100 collection sites have been identified and over 50 lbs. of seed has been collected from our target species which include: Lemons needlegrass (*Stipa lemmonii*), leafy reedgrass (*Calamagrostis foliosa*), California oatgrass (*Danthonia californica*), tufted hairgrass (*Deschampsia cespitosa*), blue wildrye (*Elymus glaucus*), big squirreltail (*Elymus multisetus*), California fescue (*Festuca californica*), Idaho fescue (*Festuca idahoensis*), Junegrass (*Koleria macrantha*), California Melic (*Melica californica*), Pacific reedgrass (*Calamagrostis nutkaensis*) and purple needlegrass (*Stipa pulchra*). These populations provide

- see "Native Grasslands Partnership" on page 15

Farewell to MRC's Dedicated Native Ecosystem Interns

By Hugh McGee

From October 2012 through March 2013, our Native Ecosystem Restoration interns Emily, Mason, Tyler, and Rachel (not pictured here) have volunteered their time and energy to help with our efforts in restoring and protecting the Mattole watershed. They put in over 2000 volunteer hours working on riparian, grasslands, oak woodland, invasive plant, sudden oak death, turbidity and salmonid monitoring, and nursery projects. There is no way that most of the work done over the past 6 months would have been completed without them. It is difficult for anyone to say they put in that many volunteer hours in 6 months, and even more difficult to say you did it with a positive attitude and giving it all you had, every day. These folks can. It is tough to find folks this dedicated and hard working. We are so thankful that we were fortunate enough to have them work with us.

MRC's next NER internships will run from June 1 through August 8, 2013 and October 1, 2013 through March 31, 2014. If you are interested in the internship, please contact Hugh at hugh@mattole.org.

Please welcome our newest Native Ecosystem Restoration intern, Amanda Lee.

Amanda is from Orange County, California. She has been studying Environmental Science, focusing on Ecological Restoration, at Humboldt State University for three years. When she graduates next year (if she doesn't continue with grad school), Amanda hopes to work on restoration projects involving salmonid conservation and improving waterways in the Northwest. Welcome aboard, Amanda!

Mattole Restoration Council's 30th Anniversary Celebration

Saturday ~ June 8th at the Mattole Grange Hall

Gates @ 3:30
Registration (for Field Games and Photo Contest) @ 3:30-4
Photography Contest
Kids' Story Writing Contest
Field Games @ 4:00 - Restoration Olympics! Prizes!
Contact monica@mattole.org to register your team

Ongoing Family Activities
Music outside & indoors

Dinner @ 5:30
Community Honoring of the MRC @ 6:30

Absynth Quintet 7-8
Moonalice 8:30-11

Mattole Restoration Council

community watershed restoration since 1983

Snacks, desserts, drinks, and love available all day long!
Live Auction Fun
Community events during daytime: Free
Dinner $10; $5 kids
Music $20

Straying Salmon - continued from page 5

Female coho salmon carcass found in Baker Creek. Note the black mouth with the distinctive white gum line, one diagnostic that helps to distinguish coho from Chinook salmon and steelhead.
Photograph by Nick Tedesco

populations. Salmon, using their olfactory sense, have the ability to distinguish between populations, species, sex, reproductive state, and even to recognize their own family members (Brown and Brown 1996). Once a population (population A) gets too low, if only members of a salmon's family are available when it comes time to spawn, inbreeding will weaken the genetics of a given population. Salmon, after homing and finding no suitable mates, I speculate, would then stray to a different system (population B) to spawn. If a salmon from a different system strayed into population A, then they may spawn and add different genes to the population.

Straying is important for colonizing/re-colonizing habitat. Much of the present range of Pacific salmon was glaciated 10,000 to 15,000 years ago, so most current populations were founded by strays since then (Quinn, 2005). In Glacier Bay, Alaska, new habitat appears as glaciers recede, and new habitat is colonized by straying salmon as it becomes suitable for spawning.

What proportion of salmon stray?

This is a rather loaded question, because the proportion of salmon that stray is variable between species and populations. Studies have provided data on the proportion of salmon that stray; however, most of these studies have been on single species. In 1984, Quinn and Fresh worked on a study that analyzed the homing/straying habits of tagged Chinook salmon in the Columbia River watershed. They tagged over 1.2 million smolts; 24,139 tags were recovered, and an estimated 41,085 tagged salmon returned. They found that 98.6% of the salmon homed to the studied stream and the remaining 1.4% were strays. Of those strays, 1.7% of the strays (or 10 salmon total) went outside the Columbia River watershed, while the vast majority of the remaining strays were found near the studied stream on the Columbia River (Quinn 2005).

Little information exists on comparative straying rates among species (Quinn, n.d.). However, in 1954 Shapovalov and Taft published a landmark study on two coastal California creeks: Waddell and Scott creeks. This study included two species, coho salmon and steelhead, and it considered straying between the two streams. The study lasted over 7 years, and had two important conclusions: first, that the proportion of both coho and steelhead homing to their natal stream was far more than would have been expected by chance, but not 100%; and second, that a higher proportion of coho salmon strayed than steelhead.

Two factors that may affect straying are: how much specialization is a factor in a salmon's life, and the age at which a salmon matures and migrates to the ocean. Some salmon species have stricter demands when it comes to freshwater habitat. If you are highly specialized, you may be less likely to stray because you need the unique conditions found specifically where you were spawned. If specialization in freshwater were the largest factor affecting straying, the species expected to stray from most to least might be pink and chum (relatively equal), Chinook, coho, then sockeye. Additionally, salmon mature at different ages. For example, all pink salmon mature at age 2, while age of Chinook salmon maturation varies. This varying age of maturity is like "straying in time" and may influence the evolutionary need to stray in space. If a cohort of pink salmon return to spawn and find unfavorable conditions in one year, then an entire cohort could be wiped out. Chinook salmon, since they return to spawn at varying ages, have a higher chance of encountering at least some favorable spawning conditions. If the age at which a salmon matures is the largest factor affecting straying, the species that stray from most to least might be pink, coho, chum and sockeye (relatively equal), then Chinook (Quinn 2005). However, we do not know the relative influences of specialization versus age at maturation, and rather than working independently, these factors likely interact.

What does it all mean?

Due to high rates of tectonic uplift, weak rock, and torrential rainfall, along with local land-use practices and variation in precipitation and streamflows, I believe Thomas Quinn would say the Mattole River has low stability (simply meaning that the conditions in some years are better than others). According to DFW, the Mattole has a very low coho population. Coho also have some of the most stringent habitat requirements while in fresh water. These are all strikes against the hope of recovering the coho population in the Mattole River. Looking at the research, the majority of Mattole coho will try homing back to the Mattole; however, there may be a slightly higher chance that they will stray based on the above conditions. Other river systems, like the Eel River, may need genetic diversity that a genetically Mattole salmon will bring when it strays.

Any salmon that return to spawn in the Mattole, as long as they spawn successfully, are producing Mattole salmon. The offspring (assuming they survive to adulthood) will more than likely home back to the Mattole River to spawn. Because of our low population of coho, we need the genetic diversity that strays bring to this river system. Those coho are probably strays from the Eel River. To this statement I say: good! We need them for a number of reasons, just like they perhaps needed to stray from the Eel River or whatever system they came from. Perhaps some of the coho observed in the Eel are strays from the Mattole.

Straying and the ability to colonize new areas over evolutionary time is important, but little research has been done on this topic (Quinn, n.d.). As long as suitable habitat is protected and allowed to recover, straying gives me hope that the Mattole coho salmon population will recover. Salmon strongholds will be needed in order for fish to recover on a coast-wide scale. As salmon stray, populations will slowly colonize/re-colonize habitat where they have been extirpated. Taking the long view, as habitat recovers from climate change, human-induced habitat destruction, and as populations recover from over-consumption by humans, salmon will adapt and thrive. Then, in the distant future, salmon will truly be at historic numbers. That is the world I want to live in.

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CALIFORNIA'S HIGHEST ENVIRONMENTAL HONOR AWARDED TO THE MATTOLE RESTORATION COUNCIL

The Mattole Restoration Council received the Governor's Environmental and Economic Leadership Award in the Ecosystem and Watershed Stewardship category at a ceremony in Sacramento on January 22.

The award recognizes the Council's Mattole Forest Futures Project, which streamlines regulation for private landowners who opt for light-touch timber harvest practices that rebuild the forest and protect water quality and wildlife. "This pioneering effort is a voluntary program that can serve as a model for other watersheds," according to the MRC's official citation.

The Mattole Forest Futures Project led to the approval of a Program Timberland Environmental Impact Report, which any Mattole landowner can use if they agree to operate using its practices. Three landowners have already obtained approval to log under its auspices, on tracts totaling 158 acres.

"We are honored by the Governor's Award, and see this as an important way for landowners who want to log sensibly and sensitively to meet the legal requirements with a minimum of paperwork and cost," said MRC Executive Director Hezekiah Allen.

The delegation accepting the award on the MRC's behalf included rancher Sally French and forest activist Richard Gienger, who served on the project's steering committee, as well as former executive directors Chris Larson and Jeremy Wheeler, former forestry program director Seth Zuckerman, and forester Greg Blomstrom of the Arcata firm BBW Associates.

The California Environmental Protection Agency administers the award, which it characterizes on its website as "California's highest environmental honor." It has been given annually for fourteen years.

Native Grasslands Partnership *- continued from page 12*

some of the last seed sources for these native grasses in the KRNCA and the Mattole Valley. Once collected, the seed is brought back to the Native Plant Nursery where it is used to propagate plants for the following year's revegetation efforts. The Nursery has grown over 140,000 native grass plugs to date.

Throughout this partnership MRC crews, with the help of students, volunteers, interns, and AmeriCorps, have planted 110,000 native grass plugs on restoration sites on Paradise Ridge, Prosper Ridge, and Spanish Flat. Over the past few years we have primarily focused on Paradise Ridge project sites where 80% of our plants were installed. With Paradise Ridge project sites almost completely planted, native grass restoration efforts will begin to focus on the Prosper Prairie Restoration Project. This is a multi-faceted restoration project that will include fuels reduction, broadcast burning, native plant revegetation, and invasive plant removal with the goal of enhancing nearly 1000 acres of publicly-owned coastal prairie in the northern portion of the King Range National Conservation Area (KRNCA).

In addition to revegetation efforts, MRC crews have also made an effort to hold the line of conifers that are encroaching on KRNCA grasslands. Over the past few years crews have backpacked out to remote areas such as Oat Ridge, Telegraph Ridge, Spanish Ridge and Lake Ridge to remove young conifers by hand.

Although we have accomplished a lot over the past seven years, there is still an enormous amount of grasslands enhancement to do in the KRNCA, and throughout the Mattole. The MRC looks forward to continued partnership with BLM, CLF, and other grassland enthusiasts in our efforts to gain a better understanding of grassland ecosystems and restore and promote diverse coastal prairies.

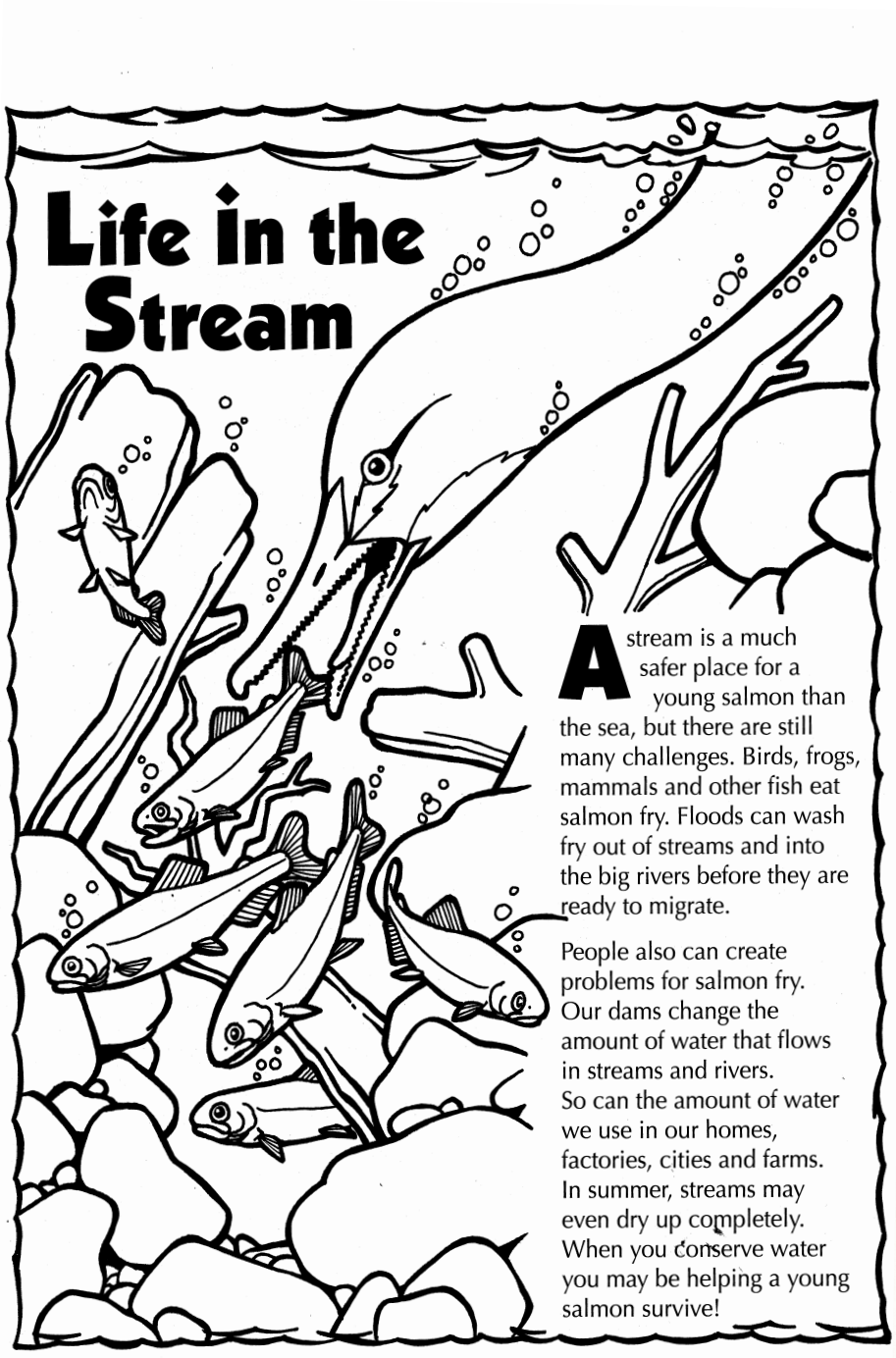
If you would like to learn more about KRNCA grasslands, please join us this summer for native seed collection volunteer days. For more information please contact hugh@mattole.org.

Native grassland enhancement crew planting on Paradise Ridge. ***Photograph by Hugh McGee***

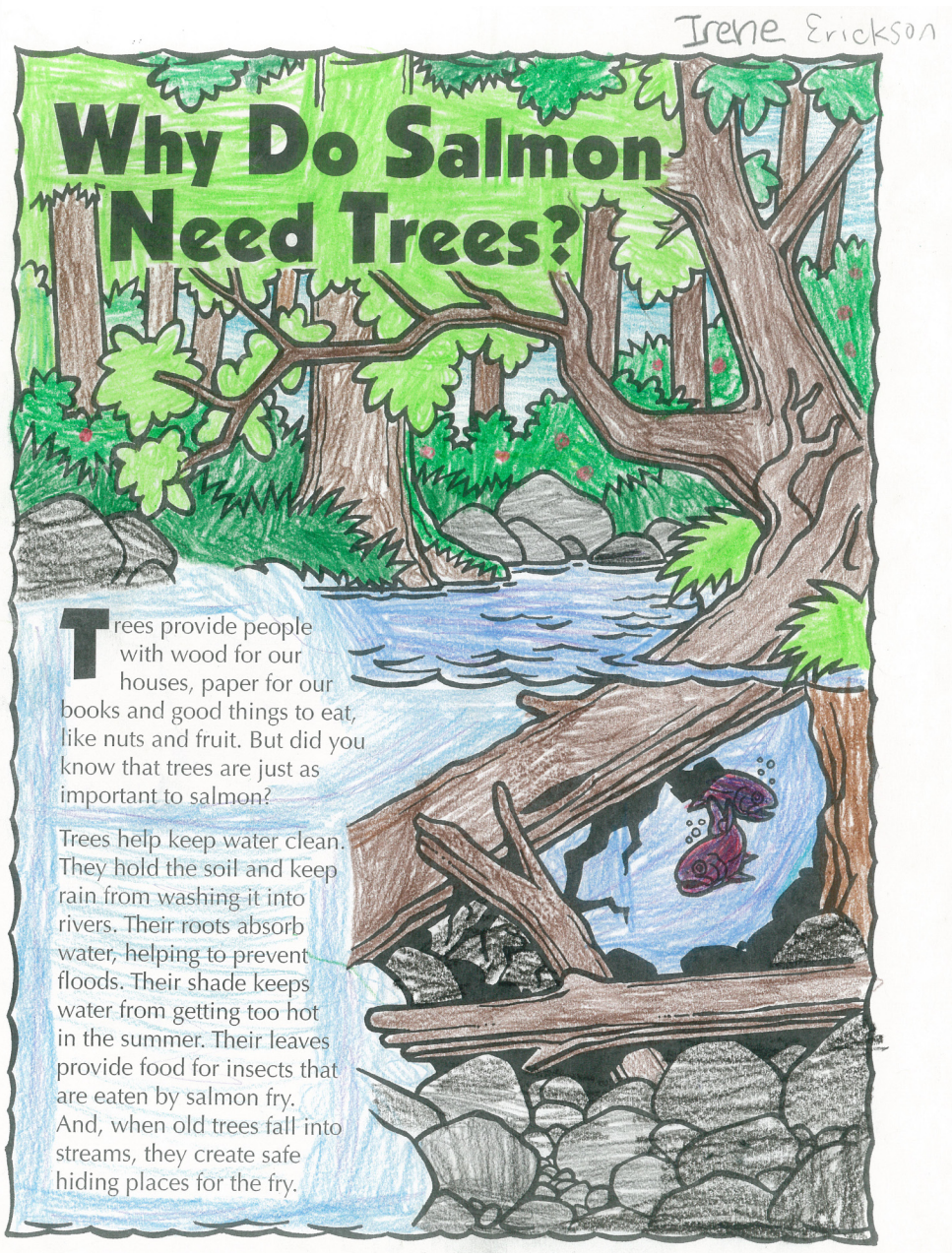
Kids' Page

This page is dedicated to stuff for, about, and by kids only!

Creative Coloring Time!



Color in this fish-eating bird as she dives underwater in search of a tasty treat.
You can add extra details to your coloring project - just look at how Irene added red flowers to her understory, and gave her fish two shades of purple!



Late-Breaking News: We'd like to thank Clarence Hagmeier for single-handedly organizing volunteer Scotch broom pulling days. You rock, Clarence!

BECOME A MEMBER OF THE MATTOLE RESTORATION COUNCIL!

Please consider becoming a member of the MRC. Becoming a member is one of the easiest ways to become a part of the Mattole restoration movement. Your membership dues are extremely important to us, allowing us to pursue important work that may otherwise fall through the cracks between our grants and contracts.

Additional Benefits of Membership:

* Subscription to our twice-yearly newsletter.
* 20% discount on custom mapping services (applies to labor costs only).
* Members who are also residents or landowners in the Mattole watershed are eligible to vote in our board elections.

If you'd like to become a member, please visit our website: www.mattole.org/content/join-us

DONATE TO THE MATTOLE SALMON GROUP!

The Mattole Salmon Group is a non-profit organization dedicated to long-term restoration of salmon populations in the Mattole watershed. Your donation to the Mattole Salmon Group is tax deductible, goes directly to our organization alone, and is used to fund restoration or monitoring projects benefiting salmon in the Mattole River.

Supporters may donate any amount at any time, and may choose one of the following ways to donate. All donors can receive our newsletter by mail and may elect to receive email updates about our activities.

* Donate online! www.mattolesalmon.org

* Donate by mail! You can send a check made out to the Mattole Salmon Group to our headquarters on the Mattole:
PO Box 188, Petrolia, CA 95558.